

PhoenixCreator

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Welcome to PhoenixCreator

Thank you for choosing PhoenixCreator

Phoenix is a professional quality model flight simulator for all levels of radio control pilot - from absolute beginner through to competition.

Featuring world-class physics, photo-realistic graphics and a huge range of features, training modes and competition modes, Phoenix makes learning to fly and perfecting your skills faster and easier than ever before.

This manual will help you get the most out of your Phoenix experience. To get information on a specific topic, select it from the list on the left-hand side.

PhoenixCreator is a single tool which lets you create custom canopies for any model in Phoenix, and new to version 2.0 and above, the ability to take your panoramic photographs and produce fully functioning Phoenix flying sites - complete with weather, collision and even water.

This reference manual is divided into two sections: Custom flying sites and Model schemes.

Custom Flying Sites

Flying sites in Phoenix consist of the following parts:

- A cubic panoramic photograph consisting of 6 panels which join seamlessly to form a full 360-degree panoramic scene.
- Lighting conditions such as sun positions and light intensities.
- Collision geometry and water properties.
- Starting and special positions for models and objects.
- Weather conditions and wind areas.

Create a new flying site project by selecting the File > New > Flying Site menu.

Loading a panorama

Once you have created a new flying site project, you can load a panoramic photograph for the scene.

Choosing panoramic images

Currently only the Cubic option is available for panoramic scenes, which will require six image panels to create the entire 360-degree scene.

You can select each of the different axis to load an image into, or if they are numbered in the correct sequence you can use the Auto button to automatically load and assign the images from a folder.

To select an image for loading, click the "..." button alongside the filename edit-box to open the browser window.

When you have the panorama tool selected in the toolbox, the Panorama manipulator will appear in the main view. This lets you alter the orientation and tweak the offset position of the background to make adding collision geometry easier.

Interior

Select this option if the scene is inside. This will optimize the sunlight and shadowing modes for an interior scenery, and disable certain modes not suitable for an enclosed space.

Setting Lighting Conditions

Now that you have your panoramic images loaded, it is time to set the lighting conditions so that the 3D objects in the scene will match the panoramic background.

Sunlight position

The sunlight position is very important for a correct scene representation. With the sunlight tool selected from the toolbox the Sunlight position manipulator will be visible in the main view. You should drag the manipulator so that in the panoramic (POV) view the manipulator is aligned with the approximate visual position of the sun in the panoramic background scene.

Diffuse, Ambient and Specular colors

The default values for these colors are reasonably accurate for standard scenes in strong sunlight, but you should alter them if your scene has different lighting conditions.

Lighting Preview

This setting lets you change the type of geometry shown on the 3D view to give you an idea of what the lighting conditions will look like.

Adding Collision Geometry

Without accurately placed collision geometry, the simulated model will simply fall through the scene, and not appear to collide with any of the panoramic elements of the background. Therefore collision geometry is crucial for an accurate simulation.

Collision geometry

To add a collision geometry element to the scene, select one of the geometry classes by clicking a button in the top panel, and then click a position in the scene.

Once you have created a piece of collision geometry, it will be shown in the main scene, and a manipulator will appear which will let you position or orient the object. You can then name the collision geometry using the edit-box to the right of the top panel.

Materials

A very important aspect of the collision geometry is the material assigned to the element. This is changed by choosing a material type from the drop-box to the right of the top panel. This changes how the model reacts when it impacts with the collision object, including friction, bumpiness and how far the model sinks into the object.

Plane

Adds a plane to the scene. A plane is infinite in size, and will not let any object pass through or beneath it. Use the manipulator to set the position and rotation of the plane in the scene.

Sphere

Adds a sphere primitive to the scene. This can be resized to as large a radius as you like.

Cube

Adds a cube primitive to the scene. You can then set the cube's width, height and length, and the orientation and position of the primitive.

Cylinder

Adds a cylinder primitive to the scene. You can then set the cylinder's radius and height, and the orientation and position of the primitive.

Area

Create a 3D area object - this is a custom geometry object consisting of a shape created by you extruded to any height to form a solid object. Add as many shape points as you wish, and then use the manipulator to position and scale the height of the object.

Material-area

Create a material-area on the terrain. This will override the material of any object it is placed over, so is very useful for adding patches of for example concrete or short grass to objects with other properties.

Skyline

Creates a skyline object. This special object is for creating collision around trees, bushes or buildings on the horizon of the scene. Click once to add a point on the ground-plane, and then move your mouse to set the height of the point to that of the horizon-line in that position. Work like this around the entire perimeter of the scene if needed.

Height-map

Create a height-map object. This consists of a regular grid of points, which can then be scaled in either direction to encompass rough, hilly or irregular terrain. After you have set the size, you can then use your mouse to raise or lower the heightmap by "painting" on the object, and changing the brush size. Holding SHIFT will change between raising or

lowering the terrain when painting. Using the MOUSE-WHEEL while holding SHIFT will increase/decrease the size of the brush.

Marker

Adds a marker to the scene. These are useful for marking positions on the POV view for later alteration on the 3D view. Markers do not add any collision or appear in the exported final scene.

Delete/Copy

Deletes or duplicates the currently selected collision object.

Collision object selection

Choose a collision object by selecting from this drop-down box. Alternatively click the named manipulator of the object itself to select it.

Collision object Id

Organize your collision objects by assigning a custom name/Id to the selected collision object.

Collision object material

Choose material properties for the selected collision object. This changes important attributes such as friction, bumpiness and sink depth into the collision object.

Draw

Toggles whether the object is rendered in the scene, to let objects fly behind the object. Please note that the object itself is not drawn, but will block out 3D objects which may be behind it.

Light/Mask

These are reserved for future use and are not currently active.

Water properties

Water in Phoenix is easy to create. When you have selected the Water button, a manipulator will appear on the scene to let you set the water's height. You can also see where the water will intersect with collision objects by looking at the blue plane which will also be shown when water is enabled.

In order to control where water is shown on the scene, you can also use the water masking tool to select areas where water will and will not be drawn.

This is enabled by selecting the Edit button next to the water enabling toggle.

When active, the blue water plane will turn white initially. Brighter areas on the plane denote more solid areas of water, while darker areas denote areas where the water will be more transparent. Completely black areas will not show any water at all. To change the mask, "paint" with your mouse by left-dragging on the plane, and hold SHIFT to change from making the water more or less transparent. Using the MOUSE-WHEEL while holding SHIFT will increase/decrease the size of the brush.

Adding Positions

Positions tell Phoenix where to place objects on the scene - including start positions for various model classes, and the Spot landing position.

Add a new position

To add a new position, click the New button, and then click an area of the scene where you wish to add the position.

Once the position has been created, you can name it using the Name/Id edit-box in the middle of the top panel. See Naming your position below for more information on required names.

Delete/Copy

With a position selected, click these to copy or delete.

Naming your position

The middle edit-box lets you assign an Id or name to the position you have selected. Naming is very important for positions, as these tell Phoenix how to use that position.

Model Start positions

It is important to create default start positions for the main model types for all four pilots, as otherwise your site will not function in multiplayer mode correctly. You can then also add custom starts to make your site more enjoyable.

Default positions

You should always create the basic default starting positions for each pilot and model type, or Phoenix will not know where to place a model on the scene.

To create a default starting position, name the position "default 1", "default 2", "default 3" or "default 4" - depending on the pilot you are setting a position for. You should then select a model class from the far-right drop-box to select the type of model you are choosing a default position for.

For example, if you are setting the default starting position for helicopters and the first pilot, select helicopter from the right-hand drop-box, and name the position "default 1".

Custom positions

As well as the default positions, you can also add as many custom start positions as you wish. To do this, select a model class from the right-hand drop-box, and type a descriptive name in the centre edit-box.

Special positions

As well as the model positions, you will need to add two more positions to ensure correct and full operation:

Spot position

This sets the spot landing position, where the autorotation target will appear. To add this position, select the Helper class from the right-hand drop-box, and name the position "spot".

Windsock position

This sets the position of the windsock in the scene when it is enabled. To add this position, select the Helper class from the right-hand drop-box, and name the position "windsock".

Setting Weather Conditions

As well as the weather conditions set within Phoenix, you can also add weather conditions for the flying site itself. These will be added to any user-set conditions, and can be turned on and off by the user. Flying site weather is mostly useful when producing slope-soaring or other specialized sceneries.

Wind-speed

Set the wind speed (in m/s) for the entire scene. Wind areas will override this setting. With this tool selected, the global wind manipulator will also be shown in the screen, and you can use this to set the direction of the wind set using this box.

Wind Areas

This lets you create, copy or delete custom wind areas (windfields) in the scene. These are created much like the Area object in the collision

section, and contain specialized weather conditions for any model flying within the area.

You can name and select previously created wind-areas using the edit and drop-boxes.

Windspeed

Use this box to set the speed of the wind (in m/s) of the currently selected wind-area. You can also use the wind-area manipulator to set the direction of the wind in this area.

Turbulence

This sets the turbulence for the selected area, from 0 - 100%.

Thermals

This sets the thermal speed (in m/s) of this area.

Once you are happy with your new flying site, you can export it to Phoenix using the File > Export menu.

This will export the files into your My Documents/PhoenixRC/flying Sites folder, and your new site should become visible and selectable under the Flying Site > Change menu from within Phoenix, under the "3rd party" section.

You should also save your project regularly using the File > Save menu to avoid losing information.

Flying Site: Step-by-step tutorial

This tutorial will guide you through creating a basic flying site from a cubic panoramic image-set, and is comprised of the following steps:

- Step 1: Preparing a cubic panoramic image-set
- Step 2: Importing the panorama to a new project
- Step 3: Setting lighting conditions
- Step 4: Adding basic collision
- Step 5: Adding start positions
- Step 6: Exporting to Phoenix

Step 1: Preparing cubic panoramic images

The first step to building a custom Phoenix flying site is to have a complete cubic panoramic image-set.

This can be converted from an existing Spherical panorama, or stitched from an original set of raw images, and consists of 6 panels - one for each axis direction (+X, -X, +Y, -Y, +Z, -Z axis).

The panels must all fit together seamlessly, so if arranged in a cube shape they will form a 360-degree scene.

There are several programs available on the internet which can convert an existing Spherical-type panoramic image into the required cubic panels.

Step 2: Importing the panorama to a new project

When you have your source images ready, you are ready to import them into a new project:

- Open PhoenixCreator.

- Click the File > New > Flying Site menu.
- A new blank flying-site project will be created.

Now that you have your new project, the Flying Site toolbox will appear to the left of the main view, which controls all of the tools for shaping your custom field.

- Select the Panorama tool from the toolbox - this is the first (topmost) tool.
- From the Panorama panel to the top of the window, select the -X axis from the axis drop-box.
- Click the Browse for file button to the right of the filename edit-box, marked with a "..." symbol.
- The Browse box will appear.
- Select the cubic image-panel you wish to use for the -X axis direction.
- In the main view, the image will fill the screen in the -X direction.
- Repeat the above steps for the remaining 5 axis, until the whole view is filled correctly, and the panorama is seamless.
- If the panorama is an interior location (e.g. a Sports Hall), select the Interior button to the right of the panorama panel.

Now that your panorama is loaded correctly, you should save the project to a meaningful filename.

Step 3: Setting Lighting Conditions

With your panorama loaded, the next step is to set the correct lighting conditions for the scene:

- Select the Lighting tool from the toolbox.
- The sunlight manipulator will appear in the main view.
- Drag the Sunlight manipulator so that it lies in the same direction as the sunlight in your panoramic images.
- If required, click the Diffuse, Ambient and Specular color swatches to change the lighting colors so that they match the lighting conditions of the panorama.

Step 4: Adding Basic Collision

The next step is to add basic collision to the scene so that the model does not fall through the ground-level:

- Select the Collision tool from the toolbox.
- Click the Plane button from the collision panel at the top of the main view.
- Click an area on the ground-grid to create the plane collision object.
- A plane will appear in the scene. You may wish to rename the object using the central edit-box for easy selection later.
- If the scene ground is not short grass (the default), change the material drop-box to something more suitable (e.g. Concrete).

Now your model will sit on this ground-plane, and not fall through the perceived panoramic ground level.

Step 5: Adding Start Positions

Now you have collision in the scene, you need to let Phoenix know where it is safe and appropriate to create the models which are flying in the scene:

- Select the Positions tool from the toolbox.
- Select "Fixed Wing" from the class drop-box at the right of the top panel, above the main view window.
- Click the New button from the top panel.
- Click a spot on the ground where the first pilot's airplane model should appear. If there is a runway for instance, this would be an appropriate starting position.
- The position will appear in the scene.
- Rename this position "default 1" - this means that a fixed-wing model flown by pilot 1 will start by default in this position.
- You may need to rotate the position (by dragging the circular manipulator shown when you hold the CONTROL key down), so that the BLUE arrow points in the direction you wish the model to face by default.

- The yellow circle surrounding the position denotes a 3m radius - a good minimum distance you should try to keep between models so that they do not collide.
- Create positions for pilots 2, 3 and 4 - name these "default 2", "default 3" and "default 4" respectively.
- Select the Helicopter class from the class drop-box in the panel.
- As you did with the Fixed-wing positions, add positions "default 1", "default 2", "default 3" and "default 4" for helicopter pilots.
- If you wish, you can also add positions for gliders. If you do not then these will be created in the Fixed-wing positions instead.

You now need to add two special positions to the scene for full functionality:

- Select the "Helper" class from the right-hand drop-box in the panel above the main view.
- Add a position where the spot/autorotation landing target should appear in your scene. Name this position "spot".
- Add a position where the Windsock object should appear in your scene. Name this position "windsock".

You have now added all of the necessary positions into your new flying site, and it is ready to use in Phoenix.

Step 6: Exporting to Phoenix

You now have a basic flying site which will function in Phoenix, with a panoramic background, a ground-plane and starting positions for the models.

You can add a great deal more collision, water areas and wind-fields to the scene for increased realism.

Now you will need to export the scene so that it can be used within Phoenix:

- Choose the File > Export menu from the Main Menu bar.
- Enter a simple filename for the scene in the "Filename edit-box" - for example "Farmland". Usually this should not contain spaces.

- Enter a descriptive name in the "Enter a name for your flying site" edit-box. This will be shown in the flying site selection menu within Phoenix - for example "Flying Field". This should be short but can contain spaces.
- If you wish, enter a descriptive passage in the "Enter a description" edit-box for your flying site. This can be as long you like, and will appear in the flying site selection menu, under the scenery preview.
- Once you are happy with the above, click the Export button.
- The flying site will be exported into your My Documents/PhoenixRC/ Flying Sites folder.

You should save your flying site often to avoid losing data.

Once exported, you can select your new site using the Flying Site > Change menu in Phoenix. The site will appear in the 3rd Party section.

You can find the actual files under your My Documents/PhoenixRC/Flying Sites menu, and you can share this folder with your friends for online play.

Model Schemes

Creating a new Custom Color Scheme

PhoenixCreator aims to provide a fully-featured tool for copying existing paint scheme designs, or to produce entirely new experimental designs in an intuitive environment, and then to export these into the Phoenix simulator.

While traditional packages focus on the mapping of a 2-dimensional “texture” onto a 3-dimensional “model”, and then to alter the appearance of that model by changing the texture, this package attempts to provide a way to directly alter the appearance of the model in 3 dimensions - more closely representing how a real model would be painted.

The model can be viewed and edited in the traditional perspective view, or constrained to any of the 6 main axis directions. The user can switch between the model view and texture view, and most tools allow editing in both types of view.

PhoenixCreator supports full undo for most operations, though texture-change undo states are constrained by the available video-memory.

- Create a new color scheme project by selecting the File > New > Model Scheme menu. You will then be prompted to select an existing model to import and create a new color scheme project from.

The Main View

When you start a new project, you will see a 3D representation of the imported model in the main view window.

Swapping between views

You can view the model in both 3D and 2D texture views. Swapping between them is accomplished using your SPACE bar.

Many tools work differently in the 2D or 3D views, and you may find that some parts require the use of one or both views.

Rotating, positioning and zooming the main view

Proper orientation of the model in the main view is essential, and this is accomplished by the following controls:

Rotate the model by dragging with the right mouse button

Pan the model by dragging with the middle mouse button

Zoom the model by rolling your mouse-wheel

Colors and transparency

Selecting colors in PhoenixCreator is accomplished by clicking one of the two color swatches on the toolbox. The top-left swatch selects the Primary color - used for the main functions such as painting or flood-filling. The other swatch is for the Secondary color - used for background colors and for gradients.

You can also select transparency using the color selector to choose the opacity of brush operations.

The Paintbrush tool

The Paintbrush is a powerful 3D or 2D painting system which lets you paint directly onto the model in the 3D view, or alternatively onto the texture in the 2D Texture View.

Using the paintbrush

To use the paintbrush, select a color using the Color Swatch on the Toolbox. When your cursor lies over the model in either 3D or Texture views, you will see a preview of what effect the brush will have on the model.

To paint on the model in 3D, left-click and drag the mouse over the area you wish to paint. The model's color will change accordingly.

Changing brush properties

The size and hardness of the standard brush can be changed using the sliders to the left of the top brush panel:

Size

This controls the radius of the brush tip. Please note that very large brushes can be slow, and can overpaint areas of the model you did not intend.

You can also change the brush size by holding the SHIFT key and rolling your mouse-wheel up or down.

Hardness

This makes the brush more or less soft around the edge of the brush area.

Brush shapes

You can also change the shape of the brush from the standard round tip to paint one of many different preset decals - or create your own decals.

To select a decal, click the drop-button to the right of the Brush box at the right-hand side of the brush panel. A list of all available decals will appear, grouped into categories. Select a new brush decal to change your brush.

When you are using a non-default brush shape, you can then use the Angle control to change the rotation of the decal. You can also hold CONTROL and roll your mouse-wheel to quickly rotate the decal.

To add your own decals, simply save an image into your My Documents/PhoenixRC/Decals folder. If you add transparency to your custom decals this will also function in PhoenixCreator.

The Shape tool

The Shape tool lets you create 2-D shapes on your display, and then "project" these onto the model to create lines, curves and any other shape you wish.

Defining a shape

To start using this tool, rotate and position the model so you can see the area you wish to draw a shape onto.

Now define your shape by clicking to create points on the screen. You can create as many points as you like, but they should not overlap, or the shape will not fill correctly.

You can move points if you have made a mistake, or delete points by selecting a previously created point and clicking DELETE. You can also split a line by clicking between two previously defined points.

Once you are happy with your shape, click the right-most button on the top panel to perform the projection.

Single/double sided

Toggle this option to change between single and double-sided projection of the shape. The default single-sided mode will only fill the shape on the side you are looking at. Changing this to double sided will also fill the other side with a mirror image.

Solid/gradient fill

Choose either solid or gradient mode for the shape fill colors. The color is taken from the main color swatch, and when using a gradient you can see a preview of the gradient by looking at the gradient section of the top panel.

Beside the gradient swatch, you will see a drop-box which denotes the gradient fill axis. This lets you make the gradient move between the two colors in the three main (X, Y and Z) directions.

Reset shape

Click this button to reset the current shape, and clear all shape points.

Shape manager

Click this button to open the Shape Manager, which lets you load and save complex shapes for later use.

Create/Clear Curve

Select this button to enter Curve Mode.

While in this mode, you can select a shape line (a pair of shape points next to one another), to turn the straight line into a curve instead.

When the line has been converted into a curve, a pair of tangents will appear, and you can then drag the tangent points to shape the curve.

If you have a curved line you want to convert back to a straight line, click the Clear Curve button, and then select a curve-point-line to clear the curve.

Project shape

Click this button to perform the projection, and fill the areas of the model which lie under the shape's boundaries.

The Floodfill Tool

The Floodfill tool lets you fill an element a solid color or gradient quickly and easily.

Using the Floodfill tool

To use this tool, point your cursor at a section of the model. A box will appear around the section currently pointed at. Left-click the mouse to fill that element with the current colour(s).

Solid/gradient fill

Choose between a solid or gradiated fill mode. When you have a gradient selected, arrows will appear on the selection box when pointing at an element, showing you the fill direction. This can then be changed by selecting a different axis from the drop-down box to the right of the top Floodfill panel.

The Project Texture tool

The Project Texture tool lets you project an image onto the side, top or front of the model. This is especially useful when using photographs of your model canopy to create a new colour scheme.

Using the Project Texture tool

You can project a texture onto 6 directions: Left to Right or Right to Left (+X or -X), Top to bottom or bottom to Top (+Y or -Y), and Front to Back or Back to Front (+Z or -Z).

To setup a projection, select the axis you want to project an image onto using the left-hand drop-box. For instance, if you wish to project an image onto the side of the model, choose the +X axis.

Now load an image from the disk by clicking the "..." button. You will be shown the Browse button, and from here you can select an image from your hard disk.

Once you have selected an image, it will appear on the main view in the axis you chose.

You can then position, scale or rotate the image projection using the manipulator in the main view.

Once you are happy with the positioning, click the Perform Projection button in the top-right to finalize the operation.

Wrap/Clamp

By default, if the model is smaller than your image, it will be repeated across the model. This is the wrap mode.

If you change this to Clamp, then the image will only repeat once.

Threshold

This controls how the projection tool decides whether a face of the geometry is facing the axis you chose. Increasing this value means that the projection will extend further around the model, while reducing it means that a face will need to be facing the selected axis more directly if it is to be filled.

Single/double sided

Toggle this to change whether the projection only projects on one direction, or if it projects on both sides of the model.

Perform Projection

Click this to finalize the operation.

The Text tool

The Text tool lets you project text onto the surfaces of the model.

Using the Text tool

When you have this tool selected in the toolbox, you will see the currently set text appear in the main 3D view, in the direction and color you have set.

Changing font and characters

To change the actual text object, click the left-hand button which shows a preview of the current font and text. The text and font entry panel will appear.

From this panel, you can now type a different line of text into the edit-box, set bold or italic styles, and also choose a font from the drop-box.

Once you have made your changes, the preview on the button will change to reflect them, as well as the text object in the main view.

Solid/gradient fill

Choose either solid or gradient mode for the text fill colors. The color is taken from the main color swatch, and when using a gradient you can see a preview of the gradient by looking at the gradient section of the top panel.

Beside the gradient swatch, you will see a drop-box which denotes the gradient fill axis. This lets you make the gradient move between the two colors in either the horizontal or vertical directions.

Single/double sided

Toggle this option to change between single and double-sided projection of the text. The default single-sided mode will only fill the text on the

side you are looking at. Changing this to double sided will also fill the other side with a mirror image of the text.

Project text

Click this button to perform the projection of the text onto the model.

The Color Dropper tool

The Color Dropper tool lets you sample a color from any area of the display, to make duplicating areas of the model easier.

Using the color dropper tool

To use this tool, select it from the toolbox, and then left-click an area of the main view. The main color will then change to the color under the cursor. If you right-click the view then the secondary color will change instead.

Please note that if you hold the ALT key during many other tools - such as Brush or Floodfill - then the cursor will change temporarily to the color dropper tool.

Reset Current Tool

Click this button to reset all of the settings and preferences for the currently selected tool back to defaults.